

Colorado Procedure – Laboratory 5100-10

HMA Testing Troubleshooting Guide

1. SCOPE

1.1 This guide suggests some areas to investigate when various Hot Mix Asphalt (HMA) testing problems arise. This guide is not intended to be comprehensive.

2. REFERENCED DOCUMENTS

2.1 No documents are directly or indirectly referenced in this procedure.

3. APPARATUS

3.1 Thermometers- Conforming to the requirements of ASTM. The thermometers shall be capable of reading 77°F by 0.2°F, 140°F by 0.2°F, 300°F by 1°F.

4. MAXIMUM SPECIFIC GRAVITY OF HMA

4.1 Check temperature of water bath – required to be 77°F ± 1° (25°C ± 0.5°).

4.2 Make sure plastic cover of scale has not warped to where it is rubbing scale pan.

4.3 Make sure scale is level.

4.4 Make sure vacuum pump oil is clean and at proper level.

4.5 Make sure silica gel is dry.

4.6 Make sure all hose connectors are tight, including stoppers in bottles.

4.7 Make sure manometer has no air bubbles in the mercury column.

4.8 Flasks should be calibrated every month [weight filled with 77°F (25°C) water and lid].

4.9 Are there screens covering the openings in the stoppers to prevent crumbs from being drawn up into the vacuum system?

4.10 Is the filter on the pump inlet clean?

4.11 Was the sample split correctly, not segregated?

4.12 Check the valves to make sure they are open or shut as required.

4.13 Is agitation correct?

5. BULK SPECIFIC GRAVITY

5.1 Make sure suspension apparatus is not rubbing the side of the tank or the side of the opening on which the scale rests.

5.2 Make sure scale is level.

5.3 Make sure temperature of tank is 77°F ± 1.8° (25°C ± 1°).

5.4 Make sure tank is in an overflow condition.

5.5 Make sure the plastic cover on the scale has not warped to where it is rubbing the scale pan.

5.6 Make sure no dirt or foreign objects are touching the scale pan.

5.7 Make sure the rings at the bottom of the specific gravity (SpG) molds are clean.

5.8 Make sure molds are elevated in ovens and air can freely circulate under them before use for compactions.

6. STABILOMETER

6.1 Make sure stabilometer has sufficient oil in it.

6.2 Don't stop short of 100 when obtaining displacement.

6.3 Make sure the needle on the Ph gauge is lined up precisely.

6.4 Remove all air bubbles from the body of the stabilometer.

6.5 Is there compensation for slop between yoke guide collar and turns displacement yoke?

6.6 Does the handle turn smoothly when obtaining displacement?

6.7 Is the oven temperature $140^{\circ}\text{F} \pm 5^{\circ}$ ($60^{\circ}\text{C} \pm 3^{\circ}$)?

6.8 Are the specimens at the required temperature for a minimum of 2 hours for a force draft oven and 3 hours for a non-force draft oven?

6.9 Make sure calibration cylinder and follower have correct diameter dimensions.

6.10 Avoid tilting the stabilometer and make sure it is always held in the upright position.

7. RESISTANCE TO MOISTURE INDUCED DAMAGE

7.1 Make sure the specimen is square in the loading frame.

7.2 Make sure the loading blocks are clean, so that the sample does not sit off-center.

7.3 Make sure the samples are not removed from the water bath too early, preventing a temperature change.

7.4 Are the specimens at $77^{\circ}\text{F} \pm 1^{\circ}$ ($25^{\circ}\text{C} \pm 0.5^{\circ}$) for a minimum of 2 hours?

7.5 Is the vacuum pump oil clean, at a proper level, and the silica gel dry?

7.6 Is the scale level?

7.7 Is the 77°F (25°C) tank in an overflow condition?

7.8 Is the suspension apparatus free?

7.9 Is the manometer free of air bubbles?

7.10 Is the freezer temperature $0^{\circ}\text{F} \pm 5^{\circ}$ ($-18^{\circ}\text{C} \pm 3^{\circ}$)?

7.11 If the incubator does not have refrigeration, is it capable of maintaining a temperature of $77^{\circ}\text{F} \pm 1.8^{\circ}$ ($25^{\circ}\text{C} \pm 1^{\circ}$) when the ambient temperature is above 77°F ?

8. SUPERPAVE GYRATORY COMPACTOR

8.1 Make sure the rings at the bottom of the molds are clean.

8.2 Make sure the ram face and the height calibration cylinder are clean.

8.3 Make sure the turntable is fully rotated to the right when the mold is inserted.

8.4 Make sure the bottom disc is fully down before dumping sample into the mold.

8.5 Is the top of the sample level after loading it into the mold?

9. IGNITION FURNACE

9.1 Make sure ceramic hearth or cage is not rubbing the wall of the chamber.

9.2 Make sure ceramic tubes are not rubbing openings in the floor of the chamber - slamming door can cause the scale to move.

9.3 Make sure nothing is rubbing the pan on the external scale.

9.4 Make sure specimen or moisture correction sample is thoroughly dry.

9.5 Don't weigh specimen and moisture correction sample at widely different times - you want them to have equal percentages of moisture when initially weighed.

10. GRADATIONS

10.1 Make sure nothing is rubbing the scale pan.

10.2 Inspect the wet sieve for stretching, holes, or cracks.

10.3 Make sure each sieve in the stack is cleaned the same each time - don't leave different amounts of material in them each time.